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WONG, ALAN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,136	DETLEFSEN ET AL.	
	Examiner	Art Unit	
	ALAN WONG	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-38 and 41* is/are rejected.

7)☒ Claim(s) *39,40 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 July 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/29/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "parallel transducers" of claim 33, "additional acoustic path with at least one serial transducer connected with the first electrical port and located along the signal line" of claim 36 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 27, 40 are objected to because of the following informalities:

3. With respect to claim 27, "in series with the coupler transducers" is objected because the claim and its parent claim appear to recite only a single coupler transducer.

4. With respect to claim 40, line 2-3 appears to be incomplete because the word "which" indicated something should be described after "second coupler transducer".

5. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 21-24, 26-29, 31, 35, 37, 38, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi (WO01/56151; using the equivalent US 6,504,454 as the translation).

8. With respect to claim 21, Takahashi discloses an apparatus (Fig. 1 or Fig. 4) comprising: a piezoelectric substrate (inherently exist, not shown, well known in the art, Col. 4 line 5) comprising: a signal line comprising a first electrical port (IN) and a second electrical port (OUT); a first partial filter (First Filter); a second partial filter (Second Filter) connected in series with the first partial filter (First Filter), the first partial filter (First Filter) and the second partial filter (Second Filter) being between the first (IN) and the second (OUT) electrical ports; wherein: the first partial filter (First Filter) comprises a

first serial transducer (2) and a second serial transducer (1) located in series branches of the signal line (From IN to OUT), the first serial transducer (2) and the second serial transducer (1) being located in an acoustic path and acoustically coupled with one another (see figure), and the second partial filter (Second Filter) comprises a first coupler transducer (6) and an end-positioned transducer (5) that are located in a double mode surface acoustic wave (DMS) path (Col. 4 line 20-35, Col. 5 line 15-35), the end-positioned transducer (5) being positioned at an end of the signal line (transducer 5 connects directly with end terminal OUT, thus end of signal line).

9. With respect to claim 22, Takahashi discloses the first electrical port (IN) comprises an asymmetrical electrical port having a signal-conducting terminal (IN).

10. With respect to claim 23, Takahashi discloses a similar embodiment (Fig. 4) that is basically the same as Fig. 1 described above (same numeric number for same item description) except with an asymmetrical electrical port having a signal-conducting terminal (Fig. 4 OUT).

11. With respect to claim 24, Takahashi discloses the second electrical port (OUT) comprises a symmetrical electrical port having multiple signal-conducting terminals (Fig. 1, OUT1, OUT2).

12. With respect to claim 26, Takahashi discloses each of the acoustic path and the DMS path are bounded on both sides by reflectors (4a, 4b, 8a, 8b).

13. With respect to claim 27, Takahashi discloses the first partial filter (First Filter) comprises one or more additional serial transducers (3) in the acoustic path and in

series branch of the signal line, the one or more additional serial transducers (3) being electrical connected in series with the coupler transducers (7) of the DMS path.

14. With respect to claim 28, Takahashi discloses the second partial filter (Second Filter) comprises a second coupler transducer (7).

15. With respect to claim 29, Takahashi discloses the first (6) and second (7) coupler transducers and the end-positioned transducer (5) located in the DMS path are arranged substantially alternately (arranged from left to right as coupler transducer 6, end-positioned transducer 5, coupler transducer 7; thus alternately between coupler transducer and end-position transducer).

16. With respect to claim 31, Takahashi discloses the first electrical port (IN) is connected to the first partial filter (First Filter); the second electrical port (OUT) is connected to the end-positioned transducer (5); and the first coupler transducer (6) is connected in series with the first serial transducer (2).

17. With respect to claim 35, Takahashi discloses a signal conducting terminal of the first electrical port (IN) is connected to at least one of the first (2) and second (1) serial transducer.

18. With respect to claim 37, Takahashi discloses the second partial filter (Second Filter) further comprises a second coupler transducer (7).

19. With respect to claim 38, Takahashi discloses the end-positioned transducer (5) is between the first (6) and second (7) coupler transducers.

20. With respect to claim 41, Takahashi discloses a serial resonator (3) between the first electrical port (IN) and the end-positioned transducer (5), the serial resonator

having a constituent transducer (3) and reflectors (4a, 4b) that bounded the constituent transducer (3) on both sides (note that reflector 4a is through 1, 2; the claim does not required the reflectors be directly next to the side of the transducer).

21. Claim 21, 22, 24, 26-29, 31, 34, 35, 37, 38, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Hagn (WO01/71911; using the equivalent US 6,791,437 as the translation).

22. With respect to claim 21, Hagn et al. disclose an apparatus (Fig. 1) comprising: a piezoelectric substrate (inherently exist, not shown, Col. 2 line 56, well known) comprising: a signal line comprising a first electrical port (IN) and a second electrical port (OUT); a first partial filter (100); a second partial filter (190) connected in series with the first partial filter (100), the first partial filter (100) and the second partial filter (190) being between the first (IN) and the second (OUT) electrical ports; wherein: the first partial filter (100) comprises a first serial transducer (121) and a second serial transducer (110) located in series branches of the signal line (From IN to OUT), the first serial transducer (121) and the second serial transducer (110) being located in an acoustic path and acoustically coupled with one another (see figure), and the second partial filter (190) comprises a first coupler transducer (171) and an end-positioned transducer (160) that are located in a double mode surface acoustic wave (DMS) path (Col. 1 line 13-24, Col. 2 line 55-65), the end-positioned transducer (160) being positioned at an end of the signal line (transducer 160 connects directly with end terminal OUT, thus end of signal line).

23. With respect to claim 22, Hagn et al. disclose the first electrical port (IN) comprises an asymmetrical electrical port having a signal-conducting terminal (IN).

24. With respect to claim 24, Hagn et al. disclose the second electrical port (OUT) comprises a symmetrical electrical port having multiple signal-conducting terminals (OUT bal).

25. With respect to claim 26, Hagn et al. disclose each of the acoustic path and the DMS path are bounded on both sides by reflectors (131, 132, and unlabelled reflectors below them).

26. With respect to claim 27, Hagn et al. disclose the first partial filter (100) comprises one or more additional serial transducers (122) in the acoustic path and in series branch of the signal line, the one or more additional serial transducers (122) being electrical connected in series with the coupler transducers (172) of the DMS path.

27. With respect to claim 28, Hagn et al. disclose the second partial filter (190) further comprises a second coupler transducer (172).

28. With respect to claim 29, Hagn et al. disclose the first (171) and second (172) coupler transducers and the end-positioned transducer (160) located in the DMS path are arranged substantially alternately (arranged from left to right as coupler transducer 171, end-positioned transducer 160, coupler transducer 172; thus alternately between coupler transducer and end-position transducer).

29. With respect to claim 31, Hagn et al. disclose the first electrical port (IN) is connected to the first partial filter (100); the second electrical port (OUT) is connected to

the end-positioned transducer (160); and the first coupler transducer (171) is connected in series with the first serial transducer (121).

30. With respect to claim 34, Hagn disclose the end-positioned transducer (160) comprises at least two partial transducers (161, 162) that are electrically connected with one another and connected in series between signal-conducting terminals (Col. 5 line 1-4).

31. With respect to claim 35, Hagn et al. disclose a signal conducting terminal of the first electrical port (IN) is connected to at least one of the first (121) and second (110) serial transducer.

32. With respect to claim 37, Hagn et al. disclose the second partial filter (190) further comprises a second coupler transducer (172).

33. With respect to claim 38, Hagn et al. disclose the end-positioned transducer (160) is between the first (171) and second (172) coupler transducers.

34. With respect to claim 41, Hagn et al. disclose a serial resonator (122) between the first electrical port (IN) and the end-positioned transducer (160), the serial resonator having a constituent transducer (122) and reflectors (131, 132) that bounded the constituent transducer (122) on both sides (note that reflector 131 is through 110, 121; the claim does not required the reflectors be directly next to the side of the transducer).

Claim Rejections - 35 USC § 103

35. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

36. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

37. Claim 21, 22, 24-33, 35-38, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mita et al. (JP 2001-292050) in view of Bauer et al. (WO03/081773; using the equivalent US 7,304,553 as a translation).

38. With respect to claim 21, Mita et al. disclose an apparatus (Fig. 11) comprising: a piezoelectric substrate (130) comprising: a signal line comprising a first electrical port (136c) and a second electrical port (136a,b); a first partial filter (137, ladder filter with two series resonators and a parallel resonator); a second partial filter (135) connected in series with the first partial filter (137), the first partial filter (137) and the second partial filter (135) being between the first (136c) and the second (136a,b) electrical ports; the first partial filter (137) comprises a first serial transducer (the first resonator reached from tracing at port 136c) and a second serial transducer (the second resonator reached from tracing at port 136c) located in series branches of the signal line; and the second partial filter (134) comprises a first coupler transducer (132) and an

end-positioned transducer (131) that are located in a 3-IDT structure (131,132,133), the end-positioned transducer (131) being positioned at an end of the signal line (131 directly connects with end terminal 136a,b, thus end of signal line).

Mita et al. do not disclose explicitly the first serial transducer and the second serial transducer being located in an acoustic path and acoustically coupled with one another and the 3-IDT structure is in double mode surface acoustic wave (DMS) path.

Bauer et al. disclose a two-series resonator and a parallel resonator ladder filter (Fig. 1) with a first (IS1) and a second (IS2) serial transducer located in series branches of signal line (T_1 to T_2), and are located in an acoustic path and acoustically coupled with one another (Col. 9 line 39-62).

At the time of the invention, it would have been obvious to use Bauer et al.'s ladder filter of two series resonator and a parallel resonator in place of Mita et al.'s ladder filter (Mita: 137) of two series resonator and a parallel resonator and it would have been obvious that Mita et al's 3-IDT structure (Mita: 135) is constructed DMS structure path. The suggestion to do so is to use Bauer et al.'s ladder filter is that Bauer et al.'s ladder filter provides less-loss and space-saving arrangement for the filter elements (Bauer: Abstract); and Mita et al.'s 3-IDT structure is constructed in DMS structure path because the 3-IDT structure disclosed in Mita et al. is well known in the art to be a DMS structure path (e.g. US 6,504,454).

39. With respect to claim 22, the combination discloses the first electrical port (Mita: 136c) comprises an asymmetrical electrical port having a signal-conducting terminal (Mita: 136c).

40. With respect to claim 24, the combination discloses the second electrical port (Mita: 136a,b) comprises a symmetrical electrical port having multiple signal-conducting terminals (Mita: 136a,b).

41. With respect to claim 25, the combination discloses reflectors between the first (Bauer: IS1) and second (Bauer: IS2) serial transducers and connected to one of the signal conducting terminals of the symmetrical electrical port (Mita: 136a,b) (Bauer: Col. 15 line 4-17, reflector, not shown, can exist between acoustically coupled transducers; connected to the port (Mita: 136a,b) since the reflector would connects to the serial transducer (e.g. Bauer: IS2) which would connects to the output of ladder filter (Bauer: T_2; and the in turn through the second filter (Mita's filter 135) to the symmetrical port (Mita's port 136a,b).

42. With respect to claim 26, the combination discloses each of the acoustic path and the DMS path are bounded on both sides by reflectors (Mita: 134; Bauer: RS1, RS2; unlabelled boxes with a cross inside).

43. With respect to claim 27, the combination discloses the first partial filter (Mita: ladder filter 137, replaced by Bauer's filter) comprises one or more additional serial transducers (Bauer: Fig. 2 item IS3) in the acoustic path and in series branch of the signal line, the one or more additional serial transducers (Bauer: IS3) being electrical connected in series (through Bauer's T_1) with the coupler transducers (Mita: 132) of the DMS path (Bauer: Fig. 2, Col. 15 line 4-17; Bauer et al. teach combination of varies embodiment can be used, thus Fig. 2 teaches additional serial transducer in the same acoustic path that can be employed with Fig. 1).

44. With respect to claim 28, the combination discloses the second partial filter (Mita: 135) comprises a second coupler transducer (Mita: 133).

45. With respect to claim 29, the combination discloses the first (Mita: 132) and second (Mita: 133) coupler transducers and the end-positioned transducers (Mita: 131) located in the DMS path are arranged substantially alternately (arranged from left to right as coupler transducer 132, end-positioned transducer 131, coupler transducer 133; thus alternately between coupler transducer and end-position transducer).

46. With respect to claim 30, the combination discloses reflectors between the first (Bauer: IS1) and second (Bauer: IS2) (Bauer: Col. 15 line 4-17, reflector, not shown, can exist between acoustically coupled transducers).

47. With respect to claim 31, the combination discloses the first electrical port (Mita: 136c) is connected to the first partial filter (Mita: ladder filter 137, which is replaced by Bauer's Fig. 1); the second electrical port (Mita: 136a,b) is connected to the end-positioned transducer (Mita: 131); and the first coupler transducer (Mita: 132) is connected in series with at least the first or second serial transducer (Mita's coupler transducer 132 is coupled to the ladder filter, which is Bauer's Fig. 1 in the combination, and since the first (Bauer: IS1) or second (Bauer: IS2) serial transducers are in the series branch, they are in series with Mita's coupler transducer 132 in the combination).

48. With respect to claim 32, the combination discloses the first partial filter (Mita: 137, replaced by Bauer's Fig. 1) comprises an additional acoustic path (associated with IP) that is connected with the first electrical port (through Bauer's IS1), the additional

acoustic path comprising a parallel transducer (Bauer: IP) that is connected between the signal line and ground (see Bauer: Fig. 1).

49. With respect to claim 33, the combination discloses the first partial filter (Mita: ladder filter 137, replaced by Bauer's filter) comprises an additional acoustic path (associated with IP) that is connected with the first electrical port (through IS1), the additional acoustic path comprising parallel transducers (IP_1, IP_2; mentioned in Fig. 21) that is connected between the signal line and ground (see Bauer: Fig. 21, Col. 15 line 4-17; Bauer et al. teach combination of various embodiments can be used, thus Fig. 21 teaches, in particular, for the parallel acoustic path can be apply to Fig. 1).

50. With respect to claim 35, the combination discloses a signal conducting terminal of the first electrical port (Mita: 136c, which would correspond to Bauer's T_1 in the combination) is connected to at least one of the first (Bauer: IS1) and second (Bauer: IS2) serial transducer.

51. With respect to claim 36, the combination discloses the first partial filter (Mita: ladder filter 137, replaced by Bauer's filter) has an additional acoustic path (Bauer: Fig. 4: one of path for IS1 and IS4, or for IS2 and IS3) that has at least one serial transducer (IS1-IS4), the additional acoustic path being connected with the first electrical port (through Bauer's T_1 to Mita's 136c) and located along the signal line (Bauer: Fig. 4, Col. 15 line 4-17; Bauer et al. teach combination of various embodiments can be used, thus Fig. 4 teaches additional acoustic path that can employed with Fig. 1).

52. With respect to claim 37, the combination discloses the second partial filter (Mita: 135) further comprises a second coupler transducer (Mita: 133).

53. With respect to claim 38, the combination discloses the end-positioned transducer (Mita: 131) is between the first (Mita: 132) and second (Mita: 133) coupler transducers.

54. With respect to claim 41, the combination discloses a serial resonator (Bauer: Fig. 2 item IS3) between the first electrical port (Bauer's T_1, Mita's 136c) and the end-positioned transducer (Mita: 131), the serial resonator having a constituent transducer (Bauer: IS3) and reflectors (boxes with cross) that bounded the constituent transducer (Bauer: IS3) on both sides (note that one of the reflector is through IS2, IS1; the claim does not required the reflectors be directly next to the side of the transducer)(Fig. 2, Col. 15 line 4-17; Bauer et al. teach combination of varies embodiment can be used, thus Fig. 2 teaches additional serial resonator that can employed with Fig. 1).

Allowable Subject Matter

55. Claim 39, 40, 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

56. The following is a statement of reasons for the indication of allowable subject matter:

57. With respect to claim 39, 40, and 42, no cited references disclose the claimed connection for the transducers in addition to other limitation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN WONG whose telephone number is (571)272-3238. The examiner can normally be reached on Mon-Thurs 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817

AW